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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte LEONARD M. GREENE

Appeal 2007-2309
Application 10/659,334
Technology Center 3600

Decided: January 28, 2008

Before TERRY J. OWENS, JENNIFER D. BAHR, and DAVID B. WALKER, *Administrative Patent Judges*.

BAHR, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Leonard M. Greene (Appellant) appeal under 35 U.S.C. § 134 from the Examiner's decision rejecting claims 11-13, the only pending claims. We have jurisdiction over this appeal under 35 U.S.C. § 6 (2002).

THE INVENTION

Appellant's claimed invention is directed to a helicopter having a turbine engine protection system that injects water and/or alcohol into the engine when an over-stress condition is approached (Spec. 1). Independent claim 11 is illustrative of the claimed invention and reads as follows:

> 11. A helicopter turbine engine over-stress protection system comprising:
>
> a helicopter;
>
> a helicopter turbine engine mounted in said helicopter;
>
> an airborne tank for containing water and/or alcohol disposed within said helicopter and an inlet for receiving water and/or alcohol from a ground source of water and/or alcohol;
>
> data storage means and means for inputting a safe temperature profile for starting the helicopter turbine engine;
>
> means for measuring the actual engine temperature during start up of a helicopter turbine engine;
>
> means for sensing at least one critical operating parameter during flight operations;
>
> comparison means for producing a signal when the actual engine temperature falls outside of the safe engine temperature profile during start up of the engine;
>
> means for injecting water and/or alcohol into the helicopter engine during a start up procedure

while maintaining said airborne tank full of water and/or alcohol;

a quick disconnect coupling for disconnecting the supply of water and/or alcohol from the ground based source after completion of the start up procedure; and

means for injecting water and/or alcohol from said airborne tank into the turbine engine in response to an over-stress during flight operations.

THE EVIDENCE

The Examiner relies upon the following as evidence of unpatentability:

Latin	US 4,174,808	Nov. 20, 1979
Moore	US 4,619,110	Oct. 28, 1986
Grondin	US 5,035,811	Jul. 30, 1991
Matthews	US 6,585,009 B2	Jul. 1, 2003
Jensen	US 6,616,835 B2	Sep. 9, 2003

THE REJECTION

Appellant seeks review of the Examiner's rejection of claims 11-13 under 35 U.S.C. § 103(a) as unpatentable over Moore in view of Grondin, Jensen, or Matthews, and further in view of Latin.

The Examiner provides reasoning in support of the rejection in the Final Rejection (mailed May 4, 2005) and Answer (mailed July 14, 2006). Appellant presents opposing arguments in the Appeal Brief (filed November 4, 2005) and Reply Brief (filed August 22, 2006).

THE ISSUES

Appellant argues that "Moore does not disclose or suggest 'inputting a safe temperature profile for starting the helicopter turbine engine' or 'producing a signal when the actual engine temperature falls outside the safe engine temperature profile during the start-up of the engine'" as called for in claim 11 (App. Br. 8-9). Moreover, Appellant argues that Grondin, Jensen, and Matthews have no bearing on use in a helicopter and that such references do not disclose or suggest Appellant's "unique combination of elements" (App. Br. 10). Accordingly, the issues presented in this appeal are (1) whether Moore teaches "inputting a safe temperature profile" and producing a signal when the actual engine temperature falls outside of the safe temperature profile as called for in claim 11 and (2) whether Grondin, Jensen, or Matthews would have prompted a person of ordinary skill in the art to modify Moore to provide "means for injecting water and/or alcohol into the helicopter engine during a start up procedure while maintaining said airborne tank full of water and/or alcohol" as also called for in claim 11.

FINDINGS OF FACT

1. Moore discloses a helicopter turbine engine over-stress warning and protection system including sensors for sensing the engine temperature, the engine speed, and the output torque from the engine (Abstract). Moore's system activates an audio alarm 70 when the temperature of the turbine engine as sensed at thermocouple 36

exceeds "the predetermined levels" or when other over-stress conditions are sensed by the system's sensors (col. 3, ll. 1-11). Additionally, water may be automatically injected into the turbine engine when an over-stress condition is sensed (col. 3, ll. 12-16). Moore does not specify the source of water injected into the turbine engine.

2. In Moore's engine over-stress warning and protection system, the signal from thermocouple 36 is amplified by amplifier 50 and transmitted to an integrator circuit 74. When the output from the integrator 74 reaches a predetermined level, the comparator 80 will provide output pulses to the "or" circuit 86. The pulses will be transmitted through the timer circuit 72 to a multivibrator 66 to generate a sound pulse from the "Sonalert" sound generator 70, or into an intercom system 34, or both. Col. 3, ll. 17-52.

   Additionally, solid tone comparator 92 will serve to operate a transistor 98 to provide a solid or continuous output tone from the "Sonalert" sound generating unit 70 at a predetermined over-stress temperature level, such as 10% over the temperature limit, as determined by the input variable resistance, as illustrated in Figure 5A. Col. 3, ll. 59-64.

   Based on the above description, Moore's system activates the audio alert when the engine temperature exceeds the temperature limit by 10% or when the temperature integrated over time reaches a certain predetermined level. The temperature integration over time is

a "temperature profile" and setting the "predetermined level" to be reached by the integrator 74, in whatever manner that may be done, constitutes inputting a "safe temperature profile," that is, the permissible area under the temperature versus time curve. Consequently, the comparator 80 produces a signal when the measured temperature exceeds or "falls outside of the safe engine temperature profile."

3. Normally, helicopter pilots operate the engine well below the over-stress limits. However, when a pilot is concentrating on a task, such as lifting a heavy load with a sling, or operating into and out of tight quarters, the pilot's attention must be focused away from the cockpit instrumentation, leading to the possibility that engine limits may be inadvertently exceeded. Col. 1, ll. 24-31 and col. 5, ll. 2-13. An engine could be severely damaged as a result of a few moments in over-stress condition during such tasks. Col. 5, ll. 12-14. Moore's system, with its audio alarm and control system (for example, water cooling, as described in col. 3, ll. 12-16), is designed to alert the pilot of an over-stress condition and permits the pilot to override the power limits where necessary for safety and/or survival. Col. 1, ll. 32-34 and col. 5, ll. 17-22. In light of Moore's objective to warn the pilot of over-stress conditions, and to provide coolant to the engine if necessary, during the execution of attention intensive tasks and maneuvers of the type mentioned by Moore, it is apparent that Moore's system is intended to operate when the helicopter is airborne.

It thus follows that the water injected automatically upon sensing of over-stress conditions (col. 3, ll. 12-16) must come from a helicopter-borne tank, that is, an airborne tank.

4. Moore's system also appears reasonably capable of operating during the start up procedure and we find nothing in Moore from which a person of ordinary skill in the art would infer that the system is not operational during start up. Accordingly we find that a person of ordinary skill in the art would understand that Moore's engine over-stress protection and alert system would cause an audio alert to be generated and water to be injected into the turbine engine if the engine temperature exceeds the temperature limit by 10% or if the temperature integrated over time reaches a certain predetermined level during start up.
5. Grondin and Jensen are directed to recycling or filtering systems for treating, filtering, or cleaning contaminated fluid, such as coolant, from tanks in which they are used and returning the treated fluid back to the tank. Grondin, col. 2, ll. 4-28 and Jensen, col. 3, ll. 50-61 and col. 6, ll. 23-33. Matthews discloses a fluid maintenance apparatus for periodically maintaining the proper quality or level of non-fuel fluids, such as coolant, in transportation vehicles. The apparatus can either store and pump maintenance fluids to the vehicle 1 from reservoir 4, or pump and receive used fluids from vehicle 1 to reservoir 11. Matthews, col. 5, l. 38 to col. 6, l. 21 and col. 6, ll. 45-54. None of Grondin, Jensen, and Matthews specifically addresses

connection of the filtering or recycling apparatus to a vehicle for injection of coolant into an engine during start up while maintaining the airborne tank full of coolant.

6. Latin discloses a quick-disconnect coupling for a removable pool fountain (col. 2, ll. 15-17 and 35-36 and col. 3, ll. 29-32 and 43-45). Latin does not specifically teach use of the quick-disconnect coupling for connection to a helicopter or other vehicle.

DISCUSSION

Appellant argues claims 11-13 together as a group. Therefore, in accordance with 37 C.F.R. § 41.37(c)(1)(vii), we select independent claim 11 as the representative claim to decide the appeal, with dependent claims 12 and 13 standing or falling with claim 11.

Moore discloses an engine over-stress protection and warning system that alerts the pilot with an audio warning when an engine over-stress condition, such as engine temperature exceeding or falling outside of a safe engine temperature profile, is sensed (Facts 1-3). Further, Moore teaches inputting a safe temperature profile (Fact 2) and a comparator 80 for producing a signal when the actual or measured engine temperature falls outside of the safe engine temperature profile (Fact 2). Moore also teaches automatic injection of water from an airborne tank into the engine when an over-stress condition is sensed (Facts 1 and 3). Moore does not, however, teach a means, that is, an external source of water and/or alcohol, for injecting water and/or alcohol into the helicopter engine during a start up

procedure while maintaining the airborne tank full of water and/or alcohol, as called for independent claim 11.

According to the Examiner, it would have been obvious to use "a ground source of water/alcohol and quick disconnect couplings in Moore's system as taught by [Grondin, Jensen, or Matthews, and Latin] to supplement the coolant system so that the aircraft engine can start safely and have all the necessary coolants" (Final Rejection 2). For the reasons that follow, we agree with the Examiner.

> When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.

KSR Int'l. Co. v. Teleflex Inc., 127 S.Ct. 1727, 1740 (2007). Moreover, while there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness, "the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *Id.* at 1741.

As evidenced by Matthews, for example, fluid maintenance apparatus for periodically maintaining the proper quality or level of fluids, such as coolant, in transportation vehicles were well known in the art at time of Appellant's invention (Fact 5). The apparatus of Matthews includes a reservoir 4 and pump for storing and pumping maintenance fluids to the vehicle. While Matthews does not specifically disclose use of such a fluid maintenance apparatus for a helicopter, a person of ordinary skill in the art would have recognized that a helicopter is a transportation vehicle having fluids, such as coolant, that should be kept at certain levels. Such a person would therefore have been prompted to use the apparatus of Matthews with the helicopter of Moore to maintain the proper quality and level of coolant (alcohol and/or water) in the airborne tank (Fact 3) of Moore. Common sense would further dictate that a logical time to perform such fluid maintenance on a helicopter would be immediately prior to take-off. While neither Moore nor Matthews specifically teaches connecting and running such apparatus during start up to inject alcohol and/or water into the engine while maintaining the level in the airborne tank (Fact 5), claim 11 does not in fact require that this be done. All claim 11 requires is means for doing so. Appellant's disclosed means is the injector 26 and a ground based source of alcohol and/or water connected to the injector, either via the airborne tank or downstream of the airborne tank, to supply alcohol and/or water to maintain the airborne tank at the full level. Moore as modified by Matthews provides such an arrangement, fully capable of operating during start up if desired (Fact 4).

"A person of ordinary skill is also a person of ordinary creativity, not an automaton." *KSR*, 127 S.Ct. at 1742. Such a person would have appreciated the convenience afforded by well known quick-disconnect couplings (Fact 6) and would have been prompted to utilize such a coupling for coupling the fluid maintenance apparatus taught by Matthews to the airborne water tank of Moore during periodic fluid maintenance operations.

For the reasons discussed above, Appellant's arguments do not demonstrate the Examiner erred in rejecting claim 11 as unpatentable over Moore in view of Grondin, Jensen, or Matthews, and further in view of Latin. The rejection of claim 11, and claims 12 and 13 standing or falling with claim 11, is sustained.

CONCLUSION

The decision of the Examiner to reject claims 11-13 under 35 U.S.C. § 103(a) is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv) (2007).

AFFIRMED

JRG

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